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None

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INT CL[4] B61B, D06F
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(54) Support ring for a collapsible bag

(57) A support ring (11), for a collapsible bag used in laundry handling systems, has two diametrically opposed suspension shackles (33) for suspending the ring from an overhead conveyor. Each shackle (33) defines an aperture for a coupling to the conveyor and has a first suspension point (21) for suspending the ring horizontally and a second suspension point (42) for suspending the ring vertically. The shackle is so shaped that between the suspension points (21, 42) portions (37, 39) of the shackle pass radially externally of the ring and are out of the plane incorporating the two points (21, 42). This shape of shackle ensures that the ring takes up a substantially vertical condition when the ring is tipped from a horizontal mode to a vertical mode, e.g. for storage.

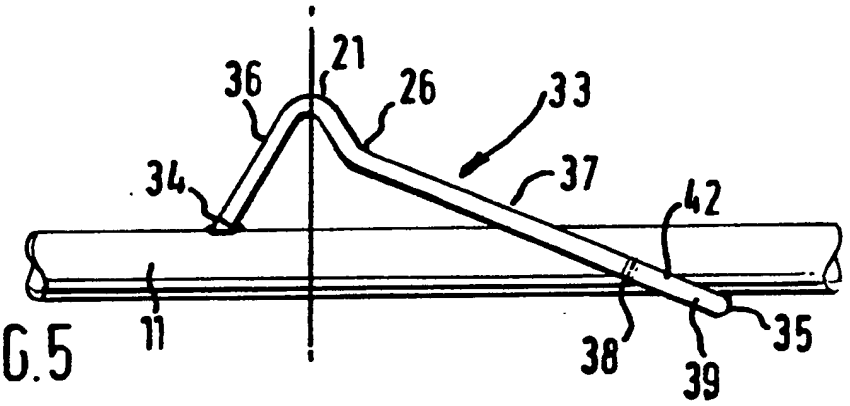

FIG.5

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

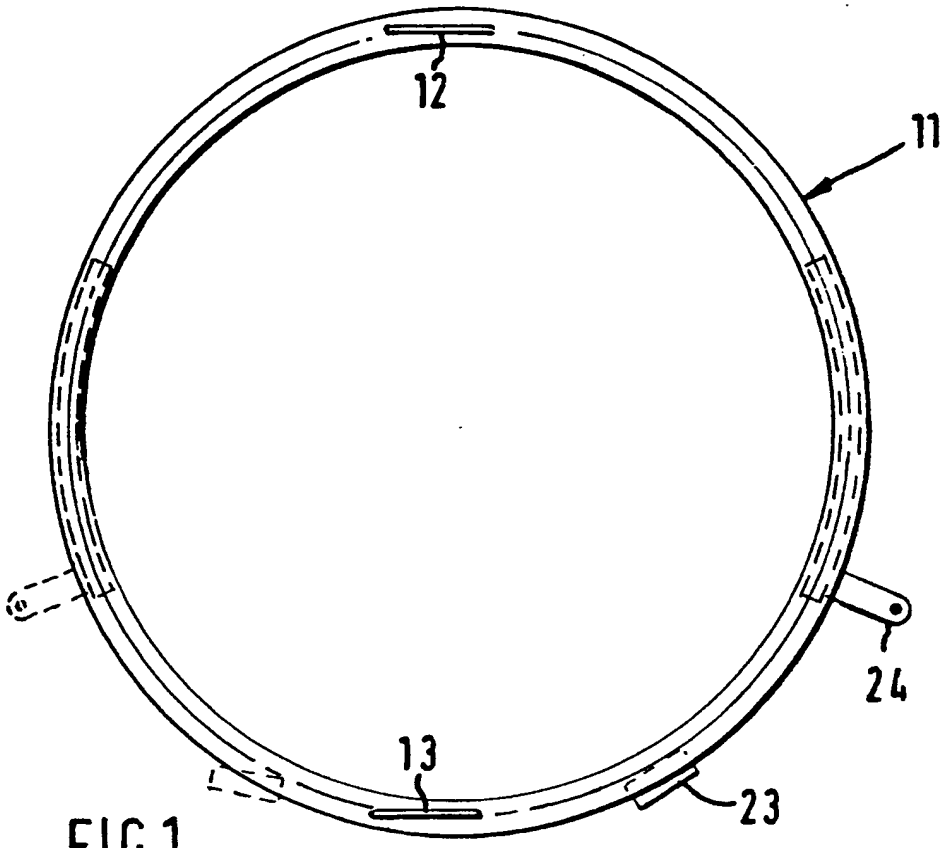

FIG.1

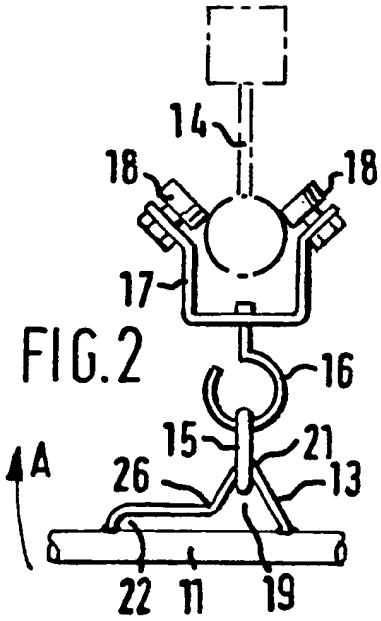

FIG.2

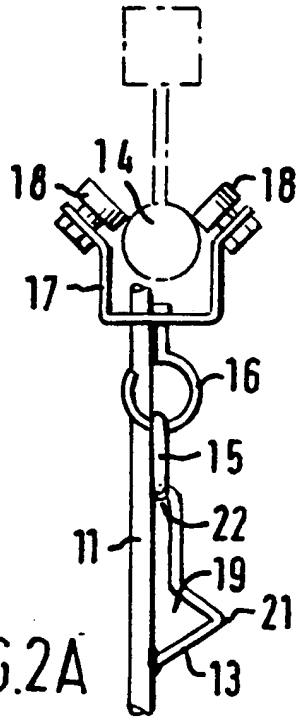

FIG.2A

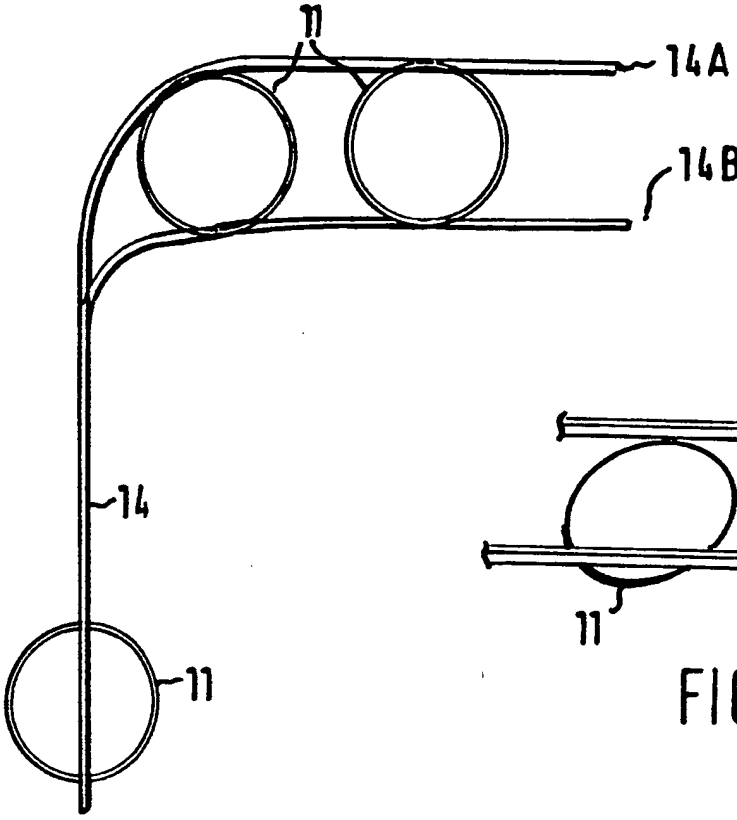

FIG.3

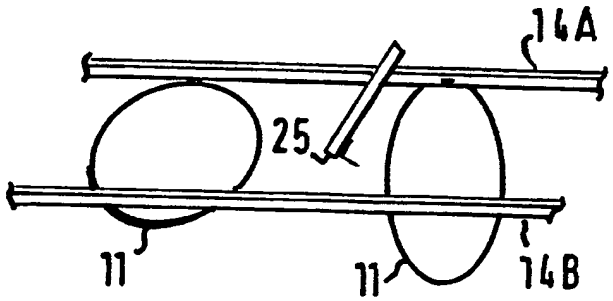

FIG.4

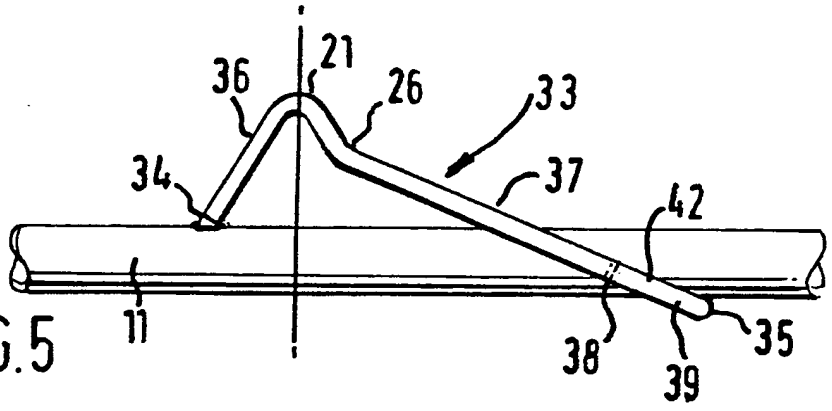

FIG.5

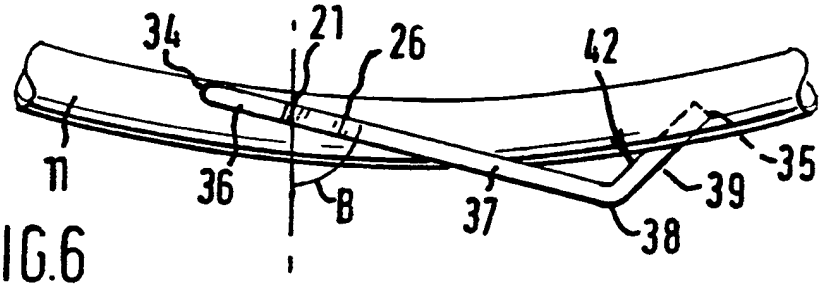

FIG.6

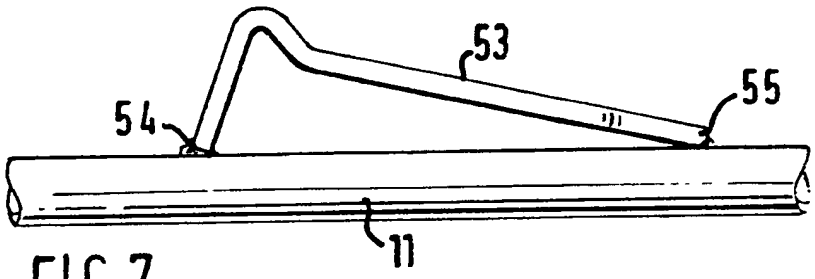

FIG.7

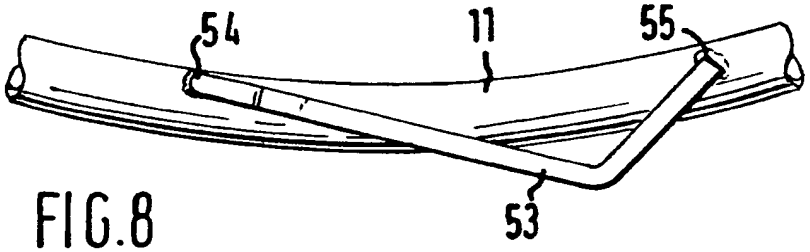

FIG.8

Support Ring for Material Handling Bag

This invention relates to support rings for bags which are used to automatically handle materials transfer operations, and in particular to support rings for bags for handling laundry.

In commercial laundries, dirty laundry and clean laundry is generally moved around the premises in collapsible bags which are supported at their upper open ends by a rigid ring, usually a circular or square ring. These rings are in turn suspended from ovrehead conveyor rails to facilitate movement of the bags around the laundry site.

The bags when empty are stored in a pair of spaced apart storage rails. The support rings are generally tipped by a mechanical means to collapse the bags and take up a substantially vertical alignment.

Problems with the prior art rings arise due to the rings not necessarily taking up the desired vertical position but being inclined at different angles so that they do not nestle together. This takes up valuable space on the storage rails.

According to the invention there is provided a support

ring for a collapsible bag used in material handling systems, said ring having two suspension shackles attached thereto at opposite balance points on the ring whereby the ring can be suspended from an overhead conveyor, each shackle defining an aperture in which a coupling can be located for attachment of the ring to the conveyor, each shackle having a first suspension point spaced axially from the ring whereby the rings can be suspended in a horizontal mode, and a second suspension point circumferentially spaced from the said first point and adjacent the ring whereby the ring can be suspended in a substantially vertical mode, wherein the shackle between said two points passes externally of the ring and out of the plane incorporating said two points

The ring can be a circular ,elliptical, hexagonal, or a square ring.

The first suspension points are located above and in alignment with the ring , and in use the laundry bag will be suspended downwards from the ring. The terms " above , upper, lower , underside , downwards etc all refer to the support ring in its normal operational horizontal mode.

The invention will be described by way of example and with reference to the accompanying drawings in which:-

Fig 1 illustrates a plan view of a prior art support ring for a laundry bag,

Fig 2 is an elevation of the suspension shackle of the prior art ring,

Fig 2a shows the prior art ring in its vertical mode,

Fig 3 is a sketch of a bag stacking unit in plan view,

Fig 4 is an isometric sketch of a bag stacking unit,

Fig 5 is an elevation of a fragment of a support ring according to the invention showing the shackle in detail,

Fig 6 is a plan view of the shackle of Fig 5,

Fig 7 is an elevation of a fragment of a support ring forming a second embodiment of the invention also showing the shackle in detail,

Fig 8 is a plan view of the shackle of Fig. 7.

Now with reference to Fig. 1 and Fig. 2 there is illustrated a prior art circular mild steel support ring 11 for a laundry handling system in a commercial laundry.The prior art will be described in detail to facilitate a full understanding of the present invention. The ring 11 has two diametrically opposed suspension

shackles 12 and 13, which are best seen in Fig. 2. During normal transfer operations the support ring 11 is suspended from a single overhead rail 14 which runs for and aft along the centreline CL between the two shackles.

Each shackle 12 and 13 is suspended by a link or coupling 15 from a hook 16 attached to a bracket 17 suspended by self-closing rollers 18 from the conveyor rail 14.

The ring 11 may also have a locking cleat 23 and a cord peg 24 mounted thereon for control of a cord which is utilised for opening and closing the bottom of the laundry bag (not shown) suspended from the ring 11. The cord can be locked into a cleat to keep the bag closed in a normal transfer operation.

The two shackles are each in the form of a steel loop having each end attached to the upper surface of the ring (when the ring is horizontal in its normal operational mode) and describing an upwardly extending bow between its two ends. Each shackle 12 or 13 lies in a single plane extending normal to the plane of the ring 11 and defines an aperture 19 in which the link or coupling can move. During the normal transfer operation , each link 15 is located at a first suspension point 21 formed at the apex of the respective shackle 12 or 13, spaced axially away from the ring, and located on the centreline

CL of the ring 11 adjacent one end of the shackle. When the ring is stored in vertical mode in a manner to be described, each link 15 is relocated at a second suspension point 22 on the respective shackle ,circumferentially spaced from the first point 21 and adjacent the ring 11. The portion of each shackle between the first suspension point and the second suspension point is kinked to provide a detent 26 to prevent the link 15 from accidentally slipping out of position during normal transfer operations.

At a bag stacking station, best seen in Figs 3 and 4, the single transfer rail 14 splits into two parallel rails 14A and 14B, and a support ring 11 and its empty bag moves along the rail 14 to a position where the roller units 17, 18, can move sideways between the two rails 14A and 14B.

When the rings 11 are between the two rails 14A & 14B they can be tipped into a substantially vertical position by an actuator 25. During this tipping operation the ring 11 rotates relative to the links 15 in the direction of arrow A in Fig. 2. The shackles move relatively to the links 15 so that the detents 26 can pass freely through the respective links 15, and the ring 11 under the weight of the bag is eventually suspended from the second suspension point 22. This is best seen in Fig. 2A.

As previously explained the rings 11 do not always take up the vertical position shown in Fig 2A, and when not doing so do not all incline at a consistent angle so that, for example, some rings may be tilted at 70 degrees and other rings at 40 degrees. This is wasteful of space at the bag stacking station.

The present invention is a support ring substantially as described for the prior art except that the shape of the shackles has been altered so that the bags stack substantially vertically and at a substantially consistent angle of inclination.

With reference to Figs 5 and 6 the ring 11 has a pair of shackles 33 of which only one is shown for convenience. The shackles 33 are mild steel loops which extend circumferentially of the ring 11 and are welded at each end to the ring. One end 34 of the shackle 33 is welded to the top of the ring 11 and the other end 35 of the shackle 33 is welded to the bottom of the ring. As before there is a first suspension point 21 at the apex of the shackle 33 located axially above the ring on the centreline of the ring adjacent said one end 34 of the shackle 33.

In this case the shackle 33 does not lie in a single vertical plane as in the prior art but describes a three

dimensional path. A first portion 36 extends from ring 11 upwardly to the first suspension point 21 and at a bias angle B to the centreline CL of the ring 11. A second potion 37 extends downwardly from the first suspension point 21 and is at the same bias angle to the centreline of the ring so that the first and second portions of the shackle 33 lie in a single plane. The bias angle B is approximately 12 - 14 degrees.

The second portion 37 extends to an outer point 38 spaced externally of the ring 11, and then a third portion 39 of the shackle extends from the outer point 38 downwardly at the same inclination but is oppositely biased to the second portion 37 to pass on the underside of ring 11 to which it is welded. It can be seen from Fig. 5 that the third portion 39 and a major length of the second portion 37, adjacent the outer point 38, lie in the same plane which is inclined to the plane of the ring 11. The second suspension point 42 is located on the shackle externally of the ring 11 adjacent the underside of the ring 11.

As before the portion of the shackle 33 between the first suspension point 21 and the outer point 38 is kinked in a manner similar to the prior art to give a detent 26 to prevent accidental tipping of the ring.

It has been found that support rings 11 of this type will consistently tip to a substantially vertical mode of between 85 - 90 degrees , so that they effectively nestle together taking up minimum space on the bag stacking station.

During the tipping operation the point of suspension of the shakle from the link 15 will move from being in axial alignment with the ring 11 to being external of the ring.

A second embodiment of the invention is shown in Fig. 7 and Fig. 8 in which there is illustrated a support ring 11 having a pair of shackles 53 which are similar to the shackles 33 excepting that one end 54 of the shackle adjacent the first suspension point 21 is welded to the top of the ring 11 and the other end 55 of the shackle is also welded to the top of the ring 11. In all other aspects the shackle 53 is similar to the shackle 33, and describes a three dimensional path which extends to an outer point located externally of the ring.

It has been found that support rings and bags with this type of shackle will take up a substantially vertical mode consistently at an angle of between 80 and 85 degrees , again allowing the bags to nestle together taking up minimum space.

Claims

1. A support ring for a collapsible bag used in material handling systems, said ring having two suspension shackles attached thereto at opposite balance points on the ring whereby the ring can be suspended from an overhead conveyor, each shackle defining an aperture in which a coupling can be located for attachment of the ring to the conveyor, each shackle having a first suspension point spaced axially from the ring whereby the ring can be suspended in a horizontal mode, and a second suspension point circumferentially spaced from the said first point and adjacent the ring wwhereby the ring can be suspended in a vertical mode, wherein the shackle between said two points passes externally of the ring and out of the plane incorporating said two points

2. A support ring as claimed in Claim 1, wherein the shackle is substantially in the form of a metal loop with each end of the loop fixed to the ring.

3. A support ring as claimed in Claim 2, wherein the shackle comprises three portions, a first portion extending from the ring upwardly to the first suspension point, a second portion longer than the first portion extending downwardly from the first suspension point to an outer point located externally of the ring, and a

third portion extending downwardly and inwardly from the outer point to the ring.

4. A support ring as claimed in Claim 2 or Claim 3, wherein the end of the shackle adjacent the first suspension point is fixed to the upper side of the ring and the end of the shackle adjacent the second suspension point is fixed to the underside of the ring.

5. A support ring as claimed in Claim 3, or Claim 4, when dependent upong Claim 3, wherein the portion of each shackle between the first suspension point and the outer point is kinked to provide a detent to prevent accidental tipping of the support ring.

6. A support ring as claimed in Claim 3, or Claim 4 when dependent upoin Claim 3, or Claim 5, wherein the first portion of the shackle, and the second portion of the shackle lie in the same plane.

7. A support ring as claimed in Claim 6 wherein said plane is at a bias angle of between 12 - 14 to the centreline of the ring passing through the two first suspension points of the ring.

8. A support ring as claimed in Claim 3, or Claim 4 when dependent upon Claim 3, or Claim 5, or Claim 6 , or Claim

7, wherein the third portion of the shackle, and the length of the second portion of shackle adjacent the outer point, all lie in the same plane which is inclined to the plane of the ring.

9. A commercial laundry material handling system in which laundry is conveyed in collapsible bags suspended from support rings, wherein the support rings are as claimed in any one of claims 1 to 8.

10. A method of transfering materials around a laundry from an overhead conveyor, in which method the materials are transferred in collapsible bags suspended from support rings, which are in turn suspended from an overhead conveyor track by shackles located at opposite balance points of the ring, so that the rings are in a horizontal mode during normal transfer and can be tipped to take up a vertical mode for storage, and when the rings are tipped from the horizontal to the vertical modes the suspension points on the rings from the overhead conveyor pass from a first point located in axial alignment of the rings to a second point located externally of the ring.

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